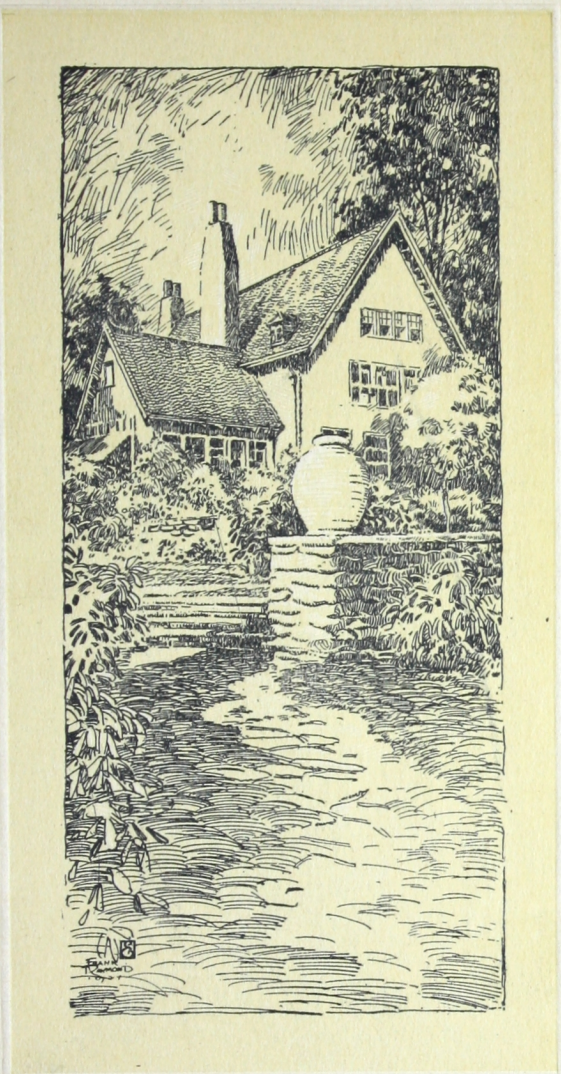


The Essentials
of Building Construction for Homes
And for Business and Public Buildings

Acknowledgments are made to the following authorities for the data used in this monograph: U. S. Bureau of Standards. National Board of Fire Underwriters. U. S. Senate Committee on Reconstruction and Production (Testimony), American Concrete Institute. Underwriters' Laboratories, Inc. Also tests made at Armour Institute of Technology and the University of Illinois.

Stocks of Metal Lath are carried by local dealers or by the following manufacturers:

The Berger Manufacturing Co., Canton, Ohio
The Bostwick Steel Lath Co., Niles, Ohio
The General Fireproofing Co., Youngstown, Ohio
Milwaukee Corrugating Co., Milwaukee, Wis.
Northwestern Expanded Metal Co., Chicago, Ill.
Penn Metal Co., Boston, Mass.
Sykes Metal Lath & Roofing Co., Niles, Ohio
Truscon Steel Co., Youngstown, Ohio
Youngstown Pressed Steel Co., Warren, Ohio

For further information, of any kind, address one of the above manufacturers, or:

Associated Metal Lath Manufacturers
72 West Adams St., Chicago, Ill.

Hall and Stairway, Plaster on Metal Lath. J. B. Benedict, Architect

The Four Cardinal Points

IN any building operation the first consideration must be the safety of the investment.

The four cardinal points in the construction of buildings of any class are permanence, beauty, economy and safety.

Permanence is fundamental. Beauty evolves naturally from the qualities inherent in permanence. To these two qualities of permanence and enduring beauty join the third one—economy of upkeep—and you have an ideal structure. The last and vital essential is safety from fire.

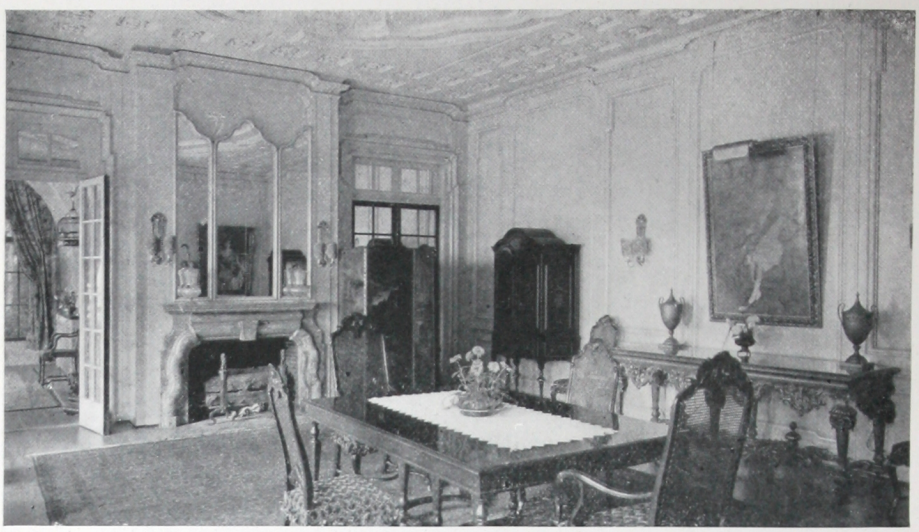
The modern science of building is eliminating constant annual outlay for upkeep and redecoration, exterior or interior. There is no reason now for putting up plaster walls or ceilings that will crack. The disfigurement and annual expense of cracked plastering has been put an end to.

As for fire protection there is no excuse now for building a residence or business building that will be exposed to danger from fire. There are only a few vulnerable points in a building and if these are protected from fire, there is not one chance in a thousand of a dangerous fire starting at any other point.

The principles of building for permanence, beauty, economy and safety apply to all residences and equally to all business or public buildings. Build right and you will save redecorating and upkeep expense, you will save on heating bills and you will always have your property in the most valuable and salable condition.

Your home is your castle. The home should be built to age gracefully, for its walls mirror the happiest memories of life. The home is the one thing in which every member of the family is a full partner and equally interested in the permanence of its comfort and beauty.

The charm of a good home is indescribable. It blends itself into the very lives of its occupants and forms the mind and tastes of the growing generations. The refinement and sense of fitness of the family may be judged by the character of the home. Build yours to harmonize with your ideals of life.



Dining Room With Ornamental Ceiling

Metal Lath Prevents Cracks

Ornamental ceilings and panelled walls, in houses large or small, are permanent in their beauty when built on metal lath

THE plastered wall and ceiling are the standard interior treatment for houses and buildings of every size throughout civilization. Time has proven plaster to be the best. Nothing has arisen to displace it. The smooth, sanitary surface of plaster is always a joy to the home-owner, and it is ideal as a foundation for decorations.

The only basic improvement that the centuries have found possible to introduce in wall construction is Metal Lath. This improvement however, is of supreme importance to the builder. Metal lath has given to the plastered wall and ceiling the two vital qualities that they lacked before its coming:

(1) Permanence (resistance to cracks).
(2) Fire Resistance.

Metal lath is a fabric of sheet steel expanded or punched so as to form a series of metal meshes or holes through which the plaster is pushed to form an unbreakable bond when the plaster sets. Metal lath has been on the market for thirty years. It is responsible for the wonderful expanse of uncracked plaster ceilings found in virtually all the finest modern public buildings all over the United States, as well as homes of every size and type.

Metal lath is now produced so cheaply that everyone should use it. Being made of metal, it does not shrink, swell, warp, twist or crack. It is fully embedded in the plaster. The familiar outlines of ordinary lath which appear so soon on the face of most plaster, crying out for early decoration are never known when metal lath is used. (See Appendix).

Modern manufacturing has put metal lath in the reach of everybody. The demand for uncracked plaster and for fire protection is causing metal lath to be generally used in the important parts of bungalows, apartment buildings, mansions, as well as monumental buildings.

Large Sun Room With Vaulted Ceiling, Plaster on Metal Lath. Ernest A. Mayo, Architect

Beautiful Effects at Small Cost

The decorative advantages of metal lath are many. A distinctive feature of any house can be made at little expense if vaulted ceilings be built. This only requires a framework of light metal bent into shape on which the metal lath is attached. Such a feature for the ceiling of sun-porch, breakfast room, entry hall, etc., gives a character and richness far in excess of its cost.

The ceilings of prominent rooms are important conspicuous places that should certainly be protected by metal lath. The plaster of kitchen and bathroom wainscot should be based on metal lath. To avoid corner cracks wall and ceiling corners should be reinforced with a narrow strip of metal lath. (See Appendix, page 15.)

A leaky radiator, or overflow from a basin will swell ordinary lath and immediately crack and stain the plaster, and often cause plaster to fall. This cannot happen with metal lath.

To the builder of the small residence, metal lath is of utmost importance. At small cost it protects all prominent rooms from plaster cracks and protects the few danger points from fire risk. One season of freedom from expense of repairing plaster may take care of the slight additional cost of metal lath protection.

There is no question about the crack prevention of metal lath. In fact, for many years the only question about metal lath has been the matter of expense, because people have felt it was necessary to use metal lath all over the house.

After reading this book you will know where you want metal lath the most and will insist on metal lath at those essential places.

A beautiful vaulted ceiling of plaster on metal lath

Striking and exquisite exterior plastered effects are constructed permanently on metal lath

Loggia with vaulted roof and arches, in country house.

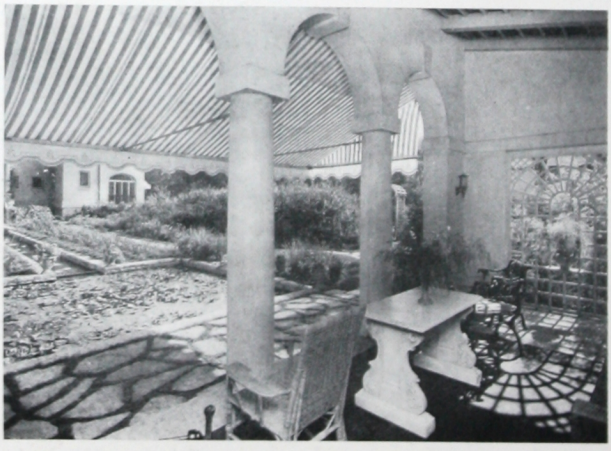
Howard Shaw, Architect

Metal Lath Makes Investment Safe

Building with metal lath means putting up a more valuable and longer lived piece of property. For instance, should you seek a renewal of a mortgage loan, an inspection will be made of the house. If you use metal lath, it will look as good as the day it was built. If you do not, you are likely to have the appraiser put a low valuation on the property.

Before building be sure to talk to your architect about metal lath. Don't buy a house in course of construction unless it has metal lath in the prominent rooms. Remember, metal lath is not costly. It is adaptable to the smallest houses as well as to large buildings. Its expense is only a small percentage over the cost of ordinary lath. It quickly pays for itself by saving repair and redecorating expense, to say nothing of its vital importance as a fire protection. For beauty, for long life, for value, for true economy, build with metal lath.

Metal Lath enables this charming plastered porch to defy dampness or temperature changes



Sun Porch on Lily Pond

F. W. Perkins, Architect

Metal Lath Stops Fire

A TENDENCY toward safer building is sweeping the country. The influence of fire prevention and conservation campaigns, is certain to effect a change in the home building of the country. And a house built now without fire protection will be at a great disadvantage if offered for sale in future years.

Twenty-three thousand lives are lost in fires in this country every year—more lives than we lost in the first year of the world war. Protecting a very few places in your house with metal lath will keep your family safe from being added to this terrible death roll.

The house with exterior walls of any fireproof material is comparatively safe from exterior fires. That is only a small part of the risk. Ninety-six per cent of all fires start inside.

The home builder thoughtful enough to take the first step toward safety by building a back-plastered stucco or other fireproof exterior wall should protect the most vulnerable spots inside his home by the use of metal lath.

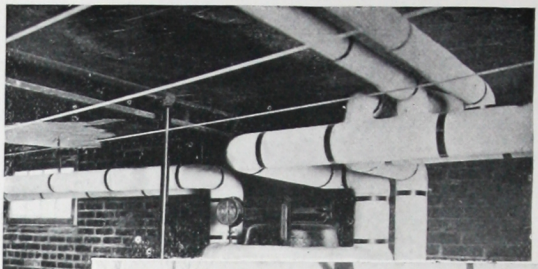
W. C. Robinson, Vice-President of the Underwriters Laboratories, testified before the U. S. Senate Committee on Reconstruction, that ordinary lath and plaster will last only about five minutes in the path of a fire.

Practically the same is true of all wall boards. Plaster boards, although incombustible, have no metal mesh internal support and weaken and fall almost as quickly as ordinary lath and plaster. The underwriters give them about 10 minutes while metal lath furnishes full one hour protection. You can understand from this how the entire inside of a house, not fire protected by metal lath, becomes a roaring furnace a short time after a fire gets headway in it.

A House Built Safe With Metal Lath

A Charming Stucco Garden Entrance

Metal Lath Saved This House



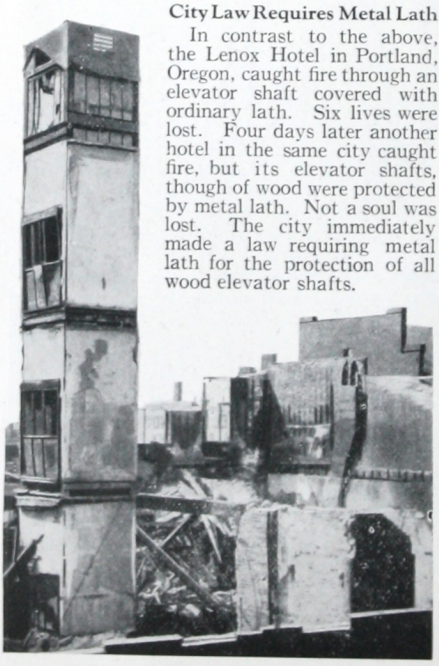
An instance of fireproof protection of metal lath was a winter fire in the residence of Judge E. G. Rose, Youngstown, Ohio. The house would have been destroyed, probably with loss of life, if the wood parts had not been protected by metal lath.

A wood pile in the heater room caught fire. Fortunately the ceiling was protected by plaster on metal lath. The cellar was discovered a roaring blaze late in the night. When firemen came they said the house was doomed. The water plugs were frozen.

But the house did not burn. It stands a proof of metal lath fire prevention. Damage was slight. The metal lath and plaster ceiling held the fire in the basement until put out by chemicals.

Saved from Fire by Metal Lath

This elevator shaft of metal lath was the only part constructed of fire-resisting materials in the interior of this building. The shaft was subjected to the severest heat, yet remained standing, little damaged, though some of the masonry walls fell.



City Law Requires Metal Lath

In contrast to the above, the Lenox Hotel in Portland, Oregon, caught fire through an elevator shaft covered with ordinary lath. Six lives were lost. Four days later another hotel in the same city caught fire, but its elevator shafts, though of wood were protected by metal lath. Not a soul was lost. The city immediately made a law requiring metal lath for the protection of all wood elevator shafts.

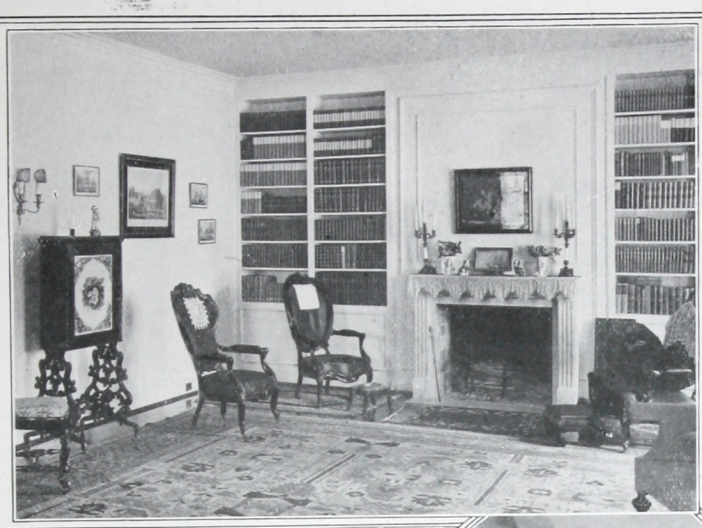
A Metal Lath and Plaster Wall That Stopped a 2 Days Fire

This partition of metal lath and plaster was in the Monticello Hotel in Norfolk, Va., in a fire that burned two days in that city. Diagonally across the street from the hotel building was the Lenox Building, of the same general construction, except that all partitions were ordinary lath. Within three to four hours after this building caught fire it was completely ruined.

In contrast to this, it was possible to reconstruct the Monticello hotel at comparatively little expense or delay. The main stairways, protected by metal lath, were practically intact.

Do you have to wait for tragedy to induce you to protect the stairwells in the house you plan to build? Pick out the Danger Points and *protect them.*

(For details and instructions, see Appendix.)



Metal Lath protects the walls around this fireplace.

Metal Lath Stops Fire

Most fires are not discovered until well under way. No matter how prompt the fire department, a few minutes to escape is not enough to provide for the safety of your family.

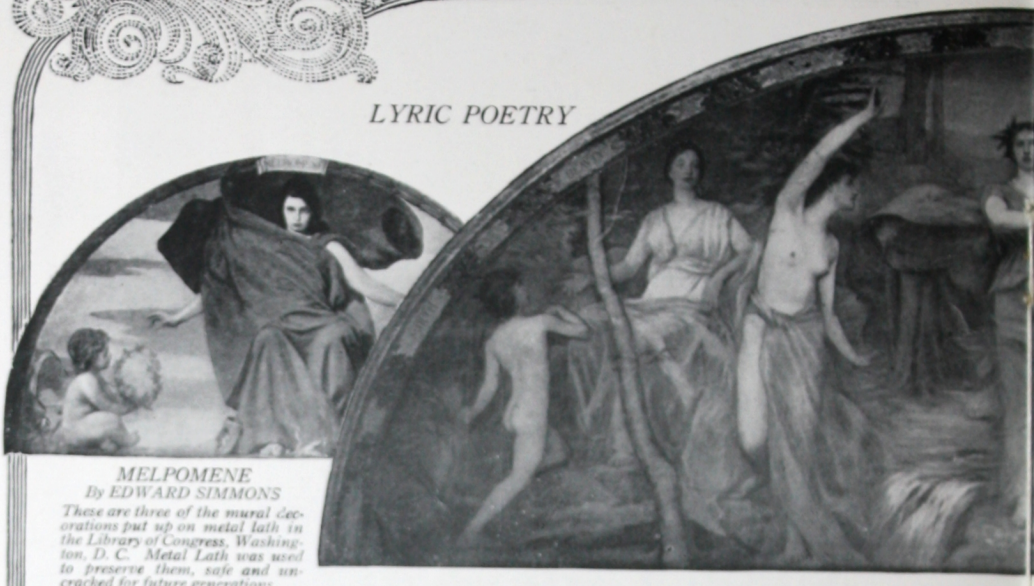
Metal Lath, being incombustible, acts as an effective support and holds the plaster securely in place. The most terrific tests have proved this, not only laboratory tests, but the test of actual experience in fires. Metal lath has saved its thousands of lives from death in fires.

Flames quickly eat through the interior plaster on ordinary bases. The spaces between the partitions become flues for the flames. Then nothing can save the house. With metal lath as a plaster base, a fire is stopped and cannot get between the walls.

A wood partition that acts as a support for floors above especially needs metal lath protection. Other points that should be fully protected by fire-resistive metal lath are the ceilings under inhabited floors, especially over heating plants and coal bins, at chimney breasts, around flues, back of kitchen ranges, under and around stairs. Fire stops of metal lath should be placed within hollow walls. (See Appendix page 16).

In view of the small present cost of metal lath and the fact that it will pay for itself in saving repair expense, you cannot afford to risk your property—above all you cannot afford to risk the lives of your family by building without it.

Metal Lath protects these stairways



MELPOMENE
By EDWARD SIMMONS

These are three of the mural decorations put up on metal lath in the Library of Congress, Washington, D. C. Metal Lath was used to preserve them, safe and uncracked for future generations.

PROOFS FROM THE REC

Never Heard of a Crack When Metal Lath Was Used

McNulty Bros., Inc., New York

We have yet to hear of the first complaint of cracking or other trouble on any of the work we have done on metal lath. We believe metal lath to be the most efficient base for plastering purposes and the best preventive against cracks.

Metal lath was used on the following buildings:

Biltmore Hotel, New York, N. Y.
Belmont Hotel, New York, N. Y.
Educational Bldg., Albany, N. Y.
Wanamaker Store, New York, N. Y.
Macy's Store, New York, N. Y.
Strand Theatre, New York, N. Y.
Shubert's Theater, New York, N. Y.
New Amsterdam Theater, New York, N. Y.
Sub. Post Office, New York, N. Y.

as well as many other large buildings not only in New York, but throughout the East.

P. G. Moore, Jr.

No Cracks in 14 Years Metal Lath Walls "Crack Proof"

S. Jacobs & Company, Minneapolis, Minn.

In 1907 we remodeled our building to accomodate the U. S. Cigar Stores. We had erected at that time solid metal lath and channel partitions. These partitions have been in place as you may see about 14 years, and we have found them durable, sound proof, as well as crack proof.

L. Metzger

"Impossible to Crack" Hand-ball Court Wall

Minneapolis Athletic Club

For your information the solid partition work in the wall in our gymnasium has been in use constantly for the past three or more years as a hand ball court and undergoes a great deal of hard usage. It has given splendid satisfaction. We find in this particular partition work where the lath is bent into all corners and the ends brought down at least 4 inches on the side, it makes it impossible to crack.

G. B. Morrison

Metal Lath 25 Years Old Stopped This Fire

Springfield, Illinois

The Workman Building on Sixth Street, was erected twenty-five years ago and metal lath was used in all the partitions.

Two years ago a fire started in Dr. Maxwell's office on the third floor at midnight, and burned the entire furnishings and wood trim of the room, eating its way through the floor and letting the radiator fall through to the floor below. But at no time did the fire get through the partitions and the firemen gave all the credit to the use of metal lath in the partitions which confined the fire to the room and floor on which it originated.

Herbert Georg

Advises Metal Lath As Fire Protection

Helmle & Helmle, Architects,
Springfield, Ill.

We cannot say too much in favor of metal lath and especially recommend it to be used as a fire retardant over the heating plants, under and around stairways, at chimney breasts and around flues.

For interior walls we find there is nothing superior to metal lath as the most satisfactory decorating results are always secured, as the walls are free from cracks.

Helmle & Helmle

Metal Lath Saves Money This User Proves

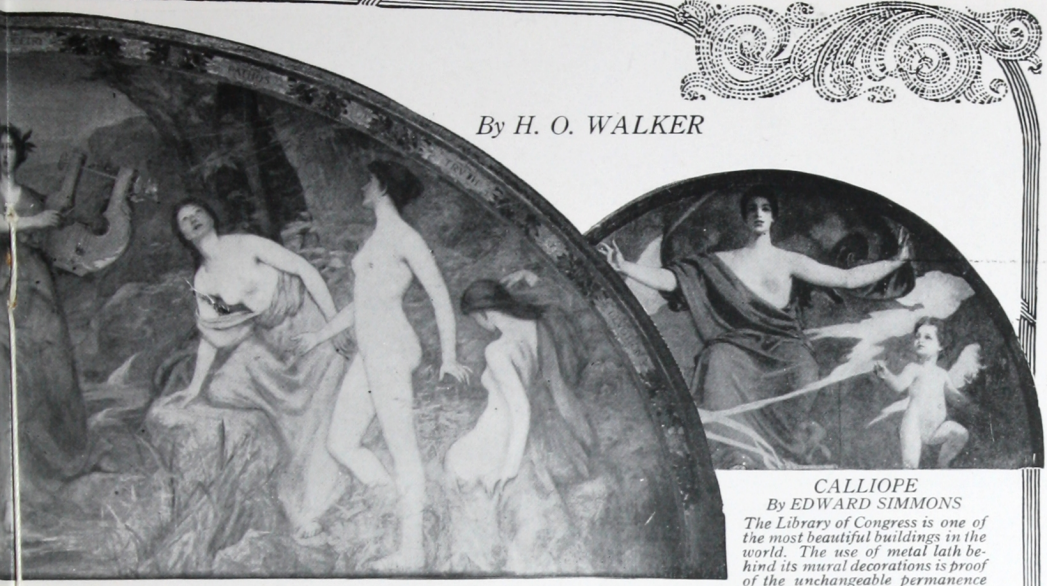
Evanston, Ill.

I would have saved money and trouble if I had used metal lath in the first place in my house. The stair hall, built on ordinary lath, cracked badly before the house was finished. Plaster was repaired unsuccessfully, then canvas was stretched over the wall in an effort to get an even surface, but cracks appeared through the canvas. Then the wall was torn out and metal lath put in and the wall replastered. I never was troubled again by cracks. This proves to me that metal lath is the most economical construction as well as the most satisfactory.

J. A. Vail

Metal Lath Prevents Cracks, Stops Fire

By H. O. WALKER



CALLIOPE
By EDWARD SIMMONS
The Library of Congress is one of the most beautiful buildings in the world. The use of metal lath behind its mural decorations is proof of the unchangeable permanence and safety of metal lath.

CORDS OF METAL LATH

Not a Crack in 29 Years
Walls Perfect as When Put Up

State of Illinois,
Macon County

My faith in metal lath and its lasting qualities is very secure owing to the fact that the partitions in the Macon County Court House, in Decatur, Illinois, put in 29 years ago, are as perfect as the day they were put up, not showing any cracks or deterioration. The partitions have been cut from time to time for alterations and the metal lath is in excellent condition.

A. H. COPE,
Building Inspector

Used Metal Lath on Thousands of Buildings—Never a "Come Back"

Klee-Thomson Co.,
New York

We have used metal lath on such buildings as the Hall of Records, Grand Central Station and thousands of other buildings and have never experienced any trouble or come-back from the same.

KLEE-THOMSON CO.—Per W. S. T.

Walls as Good Now as When Put Up

Beatty Building,
Houston, Texas

I can state that the metal lath used in the construction of my building has given perfect satisfaction. It is as good today, each and every partition, as when the building was completed. If I were constructing a new building, I would use nothing else but the metal lath.

D. R. BEATTY

"Not a Single Crack"

Builders' Exchange,
Minneapolis, Minn.

The Builders' Exchange Building is of reinforced concrete construction with tile floor. Expanded metal lath was used on some of the ceilings. I find the work entirely satisfactory, not a single crack appearing on any of them.

EUGENE YOUNG

Not a Crack in Stucco 22 Years Old

John Truesdon, Contracting Plasterer,
Galesburg, Ill.

My experience has proven that to obtain a permanent wall of stucco, the only foundation to use is metal lath. There is no doubt such stucco will last as long as the building in either new work or reclaiming an old building by overcoating with the use of metal lath as base.

A house so treated by me over twenty-two (22) years ago is in perfect condition and shows no cracks or signs of deterioration.

JOHN TRUESDON

Ceilings Like Reinforced Concrete. Plaster Held a Man's Weight

H. J. MacDonald,
Contractor,
Decatur, Ill.

I firmly believe in metal lath and am a constant user of same as there is no chance of a comparison between a job of metal lath and an ordinary lath job.

In a four-story office and store building here, all the ceilings were of metal lath and plaster. After the buildng had been completed we had to cut through the floors and the carpenter frequently stepped on the exposed ceilings, but did not injure them in the least; they stood up like reinforced concrete.

H. J. MCDONALD

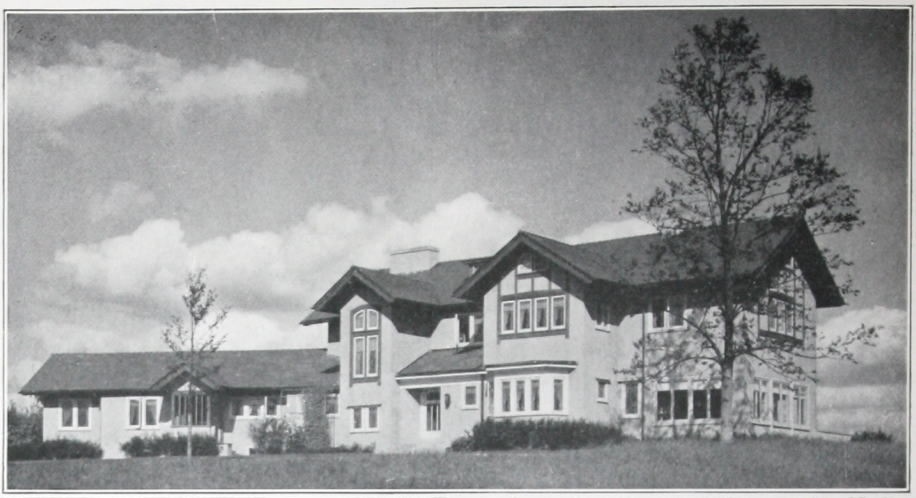
Metal Lath Ceilings Stood Terrific Test

Canton, O.

Ceilings and corners in my house which were protected by metal lath have developed no cracks in 6 years although subjected to severe tests. All the downstairs ceilings were put up on metal lath to avoid cracks. The floors above these ceilings were of hard maple which shrunk, so that the contractor laid oak floors on top of the hard maple. The hammering of nails into the hard wood was terrific, but not a particle of plaster came off the ceilings nor did any cracks develop. No cracks developed at any of the points protected by metal lath. My experience proved to me that it is much cheaper to use metal lath, to say nothing of the satisfaction of always having the house in good condition.

R. M. NICHOLSON

Metal Lath Prevents Cracks, Stops Fire



Country House, Stucco Back-Plastered on Metal Lath
Spencer, Powers and Martin, Architects

Stucco

Beautiful Economical

STUCCO is rapidly becoming the most popular style of building. The handsome residence streets, both in towns and suburbs show a constantly increasing preponderance of stucco houses. The use of stucco goes back into antiquity. The little old world towns owe much of their picturesque charm to their century-old stucco houses.

Stucco is suited to large residences as well as cottages or bungalows. It offers the greatest freedom in design. Stucco is inexpensive to build. Its repair and upkeep bills are negligible. Properly constructed, it is both fire and weatherproof. Stucco houses are cool in summer and cheap to heat in winter.

Stucco built by the "back-plastered" method on metal lath is now recognized as the correct method in new building. Improvement over the old system of simply applying stucco as a veneer is seen at once. In back-plastering no sheathing is required, actual tests proving that the walls are stronger without it. When the metal lath is in place on the studs, the

Entrance to Town House. Stucco gives great opportunity for charming, original design

Stucco and Timber construction. A characteristic stucco effect

The old house as it was when purchased

The handsome, unique little home that was made from it at small expense, by use of stucco on metal lath

An old frame house costly to maintain

The result of stucco and metal lath. A handsome house, cheap to heat and with exterior upkeep expense practically eliminated

New Houses for Old

OVERCOATING with stucco on metal lath is the way to make an old house a new one at moderate cost. There are many thousands of such beautiful homes all over the United States. All the desirable features of the old house may be retained. You have the utmost freedom in adding and alteration. The result is altogether charming. With stucco on metal lath, the new exterior has the mellowness of beautiful stucco and the everlasting strength of reinforced concrete.

Many seekers after a house that shall possess individuality and yet be relatively low in cost, deliberately search out some old frame dwelling, built in the days of simplicity and integrity. The framework of such a house usually is solid. The home when finished is a delight to the eye and the house is better than it was when new.

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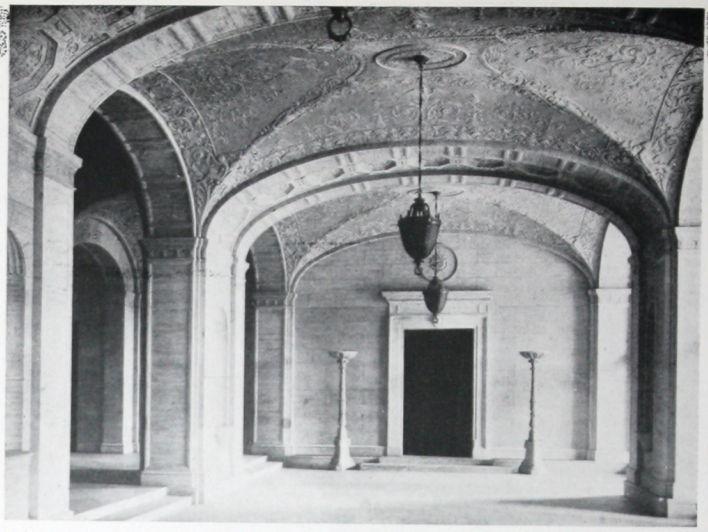
first stucco coat is applied on the outside and pushed well through the mesh. The plasterer then goes inside the house and plasters with the same material on the back of the exterior coat. The stucco thus completely imbeds the lath and forms a monolithic reinforced slab of solid concrete. (See Appendix, page 16.)

The weather resisting powers of stucco on metal lath have been established by the U. S. Bureau of Standards. In rigidity tests at Omaha, Nebraska, using full-sized samples of wall construction, the sample of Stucco on metal lath survived all tests, a diagonal pressure of 3,500 pounds (the limit of testing frame) producing no cracks in the stucco.

In a recent Southern California earthquake, there was a typical proof of the strength of "back-plastered" stucco. The exterior walls of the annex to the Inglewood Grammar School, stuccoed on metal lath, were in perfect condition after the earthquake, while the stucco on masonry walls of the main building was cracked in many places.

Experience and tests of every description prove that stucco on metal lath is the most economical fire resistive exterior construction. Discuss this thoroughly with your architect or builder before you build. If you use metal lath you are certain of the most economical permanent construction and no regrets. Build stucco on metal lath.

(See Appendix for best method of design and other valuable information.)



This beautiful ornamental ceiling is put up permanently on Metal Lath. Your walls and ceilings should be put up the same way — on Metal Lath.

Hall in Municipal Library San Francisco California, George W. Kelham Architect.

Metal Lath Throughout the Most Beautiful Public Buildings Prevents Cracks and Protects From Fire

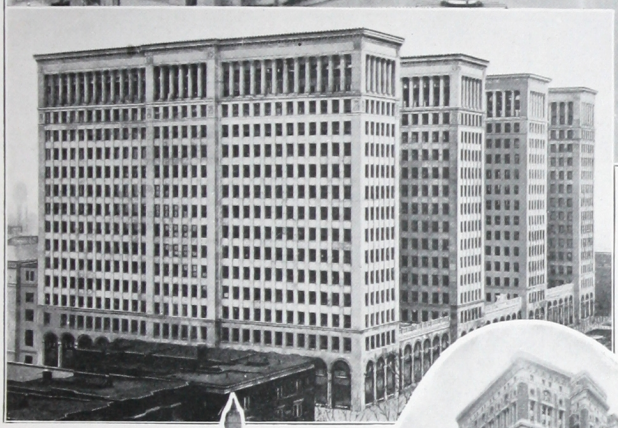
The fact that all this elaborate, ornamental plaster is put on metal lath in order to ensure that it will not crack is a lesson for you. Have the plaster in your own house, whether it is large or small, put on metal lath

The cost of metal lath is small and metal lath quickly pays for itself by eliminating repair and redecorating expense. There is no reason why you should not have it. You can put metal lath all over the house, or you can limit its use to the ceilings and corners of prominent rooms and places most liable to cracks, and to the points most liable to fire danger. This makes a practically crack protected and fire protected house.

Elaborate plaster ornamentation carrying gorgeous heavy gold leaf decoration. Plaster on Metal Lath. What is wisdom for this elaborate theatre ceiling is equally wisdom for the ceilings in your own house.

Capitol Theatre New York Metal Lath used throughout on account of the permanence of metal lath as a preventive of cracks and for its protection from fire. Thomas W. Lamb Architect

Grand Central Terminal, New York



Durant Building
Largest Office Building in the World for a Single Industry. Detroit, Mich.

Hotel McAlpin New York

Municipal Building New York

Woolworth Building, New York

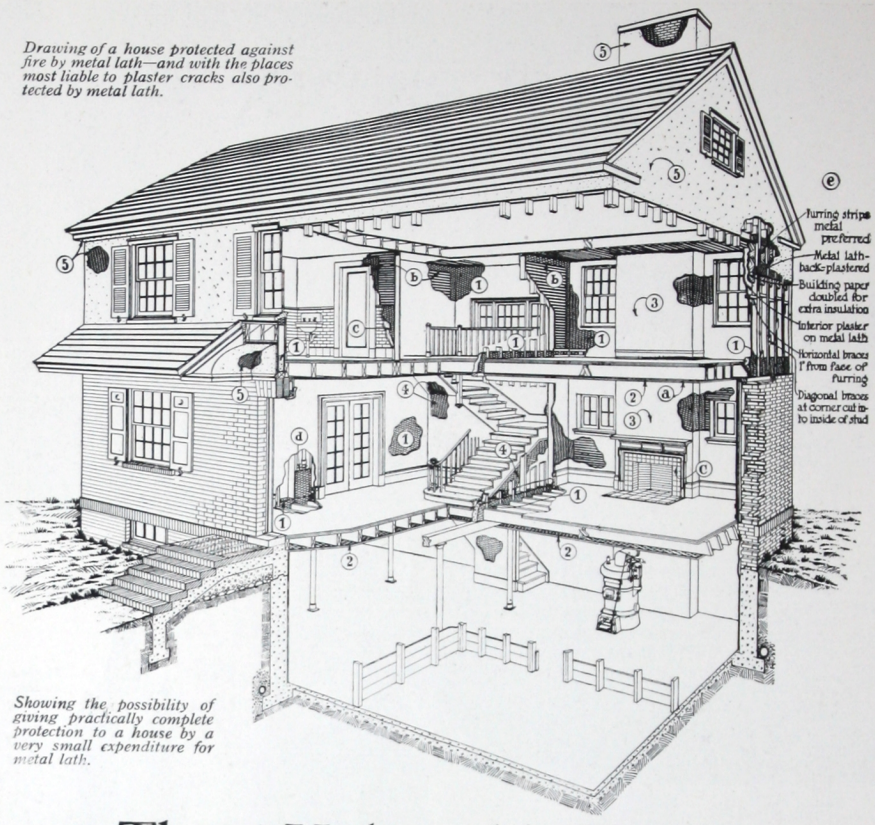
Other Famous Buildings Using Metal Lath

Library of Congress
Washington
Pennsylvania R. R. Terminal
New York
Post Office, Chicago
Wanamaker's, New York
Copley Plaza Hotel
Boston
Singer Building, New York
Shubert Theatre, New York
Biltmore Hotel, New York
And Thousands of Others.

Metal Lath was built into these buildings as an investment. The same reasoning should govern the construction of a home.

Metal Lath Prevents Cracks, Stops Fire

Drawing of a house protected against fire by metal lath—and with the places most liable to plaster cracks also protected by metal lath.



Showing the possibility of giving practically complete protection to a house by a very small expenditure for metal lath.

The 5 Vulnerable Points

THERE are certain parts in a house, just as there are in a battleship, that are more vulnerable than other parts. The naval designer seeks out the parts most liable to attack and most necessary to the safety of the ship, and gives them specially heavy armor. Common sense advises the same economical ideas in home construction. Metal lath can be used on these vulnerable parts at very little extra expense.

Statistics show that only 4% of fires come from the neighboring houses either through the roof or through the side walls. Ninety-six per cent of all fires start inside. Some start in the rooms and get into the partitions and floors, and others start inside the hollow spaces of the partitions and floors. If combustible lath is used, such a fire will form a flaming furnace throughout the building and probably will gain such headway before discovered that all the occupants cannot get out alive.

This was the condition in the Wellesley College Dormitory fire. Disciplined fire drill prevented a frightful loss of life. The inside of all the partitions and floors was a roaring mass of flame which seemed to break into all the rooms and corridors at once.

Sound construction, therefore, must prevent both types of interior fires. Look at the above illustration.

(1) All bearing partitions which hold floors must be protected against fire, or the floors will cave in. The same is true of exterior hollow walls. The firestop is of utmost importance and is often neglected unless specified, as recommended by the National Board of Fire Underwriters, to be a basket of metal lath to hold "incombustible" material.

(2) This saved the Rose house. See page 6.

(3) Many fires start at these points.

(4) Frequently, closets are built under stairs and spontaneous combustion often starts here. If the stairways fall there is little chance of the occupants saving their lives, or the firemen getting in to put out the fire.

(5) This is treated under the subject of Stucco.

(**a**) If only a little metal lath is used for crack prevention, see that it is used in your entrance hall, living and dining rooms, where your friends and your purchasers get the first impressions.

(**b**) Metal lath is very cheap to install and should reinforce the corners where ordinary lath is used in prominent rooms.

(**c**) The constant temperature change in bathroom and kitchen swells and warps ordinary lath and makes cracks inevitable unless metal lath is used. Cost of using metal lath here is slight.

(**d**) Many a crack can be prevented here.

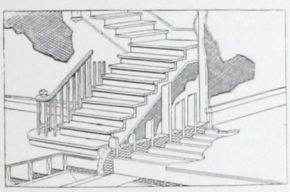
(**e**) See Stucco, pages 10 and 11, and Appendix.

APPENDIX

The following information is for the earnest reader who wishes to study and know the the details of construction, so that he can advise intelligently with his architect or builder and realize the value of the details of construction which must be built in when the building is constructed.

METAL Latn is made from sheet steel which is expanded or punched to form holes for the plasterer to push the mortar through. This mortar sets or hardens into a brittle material, but the part that is pushed through, known to the trade as the clinch or keys, holds with an unbreakable mechanical bond and does not depend upon surface adhesion. When fire attacks the plaster, the plaster is disintegrated and is likely to fall off through its own weight if it is not supported at frequent intervals. If the fire starts on the inside of a partition, there is no chance of the plaster being supported if the lath itself is combustible, and this is doubly dangerous, as fuel is added to the flames.

Metal lath will not burn, swell, shrink or warp, and is therefore permanent against all attack of fire.



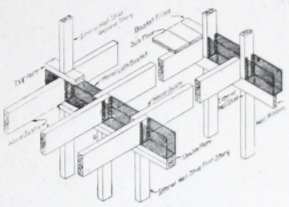
A stairway properly protected from fire by metal lath. Note the firestops under floor. A staircase so protected will not fall in case of fire.

Highest Standard Construction

Plastering is the only standard method of finishing the interior of the house or building. All other methods are substandard and should never be used on permanent homes. Some wallboards are highly inflammable and if tested by a common match will ignite easier than a cigar. Other wallboards are made of plaster and can therefcre be advertised as "incombustible." They are very thin and when attacked by fire lack the necessary metal mesh internal support and crumble as soon as their paper reinforcement is gone, falling almost as quickly as ordinary lath and plaster. Such a material has been tested by the Underwriters Laboratories and found to last but eleven minutes while the same plaster on metal lath remained intact at the end of a three-hour fire test.

Cost of Metal Lath

Naturally, the question of additional expense due to metal lath as a plaster base arises. At present costs, used only in the vulnerable interior points already named, it will cost about $50 more than ordinary plaster bases, because three-coat work is used. Is not the added satisfactcn that the home is fire-safe, and the sound endorsement of the foremost fire prevention experts in the United States, worth the additional cost of one per cent on a $5,000 home?



Fire Stops Between Studs
At juncture of floor joists and wall these baskets bent out of metal lath and filled with incombustible material, prevent the spread of fire. Use of fire stops in building is of vital importance. (See page 16).

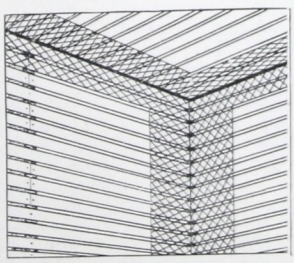
How to Apply

Application of metal lath to the positions vulnerable to fire is an exceedingly simple process. Any good craftsman can do a permanently satisfactory job by following these simple directions. The metal lath is placed with the long dimension of eight feet across the supports and fastened by nailing or stapling every six inches. The sheets are lapped not less than one-half inch on the sides, the ends are lapped not less than one inch over supports.

The sheets are first applied to the ceiling and carried down six inches onto walls and partitions. This effectively prevents corner cracking. Three coat plaster work is necessary for first class workmanship. Any kind of plaster—Portland cement, lime or gypsum, gives excellent results.

Corner Cracks Preventable

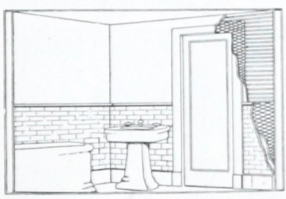
Corner cracks are the most unsightly and unnecessary cracks that occur in buildings. They are also the most frequent. Tests recently made at Armour Institute (reports of which may be had on application) prove conclusively that a twelve inch strip of metal lath bent into the corner, even where ordinary lath or plasterboard is used, will prevent corner cracks.



Ceiling and wall corners protected from cracks by metal lath. This cut illustrates proper method of bending and applying metal lath.

Reasons for Cracks

Cracks in plaster are formed in many ways—they are due principally however, to slight settlement or shrinkage in the timber. They are also due to vibrations caused by passing vehicles on hard streets, wind, romping children, slamming doors, and to extremes of temperature and humidity that come frequently in kitchens and bathrooms. If foundations settle unevenly, nothing will prevent plaster cracks. However, when metal lath is used as a wall or ceiling covering, slight movements in the house are minimized to a great extent, because of the wonderful reinforcing value of the metal lath.



Metal lath used to prevent cracks in bathroom wall. Note use of metal lath around doorway. Metal lath should be used in the same way in kitchens.

Danger of Cracks

Mr. W. C. Robinson, Vice-President of the Underwriters Laboratories, in speaking of buildings with wood joists and studs, declared:

"The fire loss in this class of buildings is already too great and every effort should be made to increase the fire resistance of the interior finish both through the materials used and the reinforcement of the weaker points. Separations in the corners induce a greater hazard than separations in the wall or partition, as they may allow fire to spread into two separate partitions or walls and thence into two adjacent rooms instead of one."

In a national questionnaire recently sent out to plastering contractors from coast to coast, the overwhelming opinion was that metal lath prevents corner cracks.

Metal lath must be built into the building. It cannot be added afterwards unless entire wall or ceiling is removed as is often done. Watch for these points when you buy or build, and insist on the most prominent rooms being protected against cracks.

A burning newspaper, showing how flame is drawn through a partition unprotected by firestops.

No Safety Without Firestopping

Firestopping is a most important feature and is frequently neglected. The firestop confines the fire in the hollow spaces between a floor and the ceiling, and does not allow it to get to the next story, or it keeps it in the floor of one room and does not allow it to spread into the partition. The usual method, when anything at all is done, is to put a piece of wood in this juncture, but the dwelling house code of the National Board of Fire Underwriters says:

> "Whenever boards are indicated as supports to hold 'incombustible' fire-stopping at any place, metal lath is recommended as a superior substitute. It is easier installed and will not burn."

In building a house, the firestop is at times willfully or unintentionally omitted, and the best method is to place special emphasis on it and include a provision in the lather's contract specifying the installation of metal lath bent into the juncture of floor joists and partition studs. This forms a metal basket which will hold any plastic material poured into the space and effectively prevent the

Showing mortar being shovelled into basket bent out of metal lath to form a perfect firestop at juncture of floor joist and studding.

hollow walls and floors from becoming veritable flues to carry fire throughout the structure.

Watch the construction of your building and see that some kind of firestops are used and test them with a burning newspaper to see that they will actually stop fire.

Metal lath firestop also is positive proof against rodents.

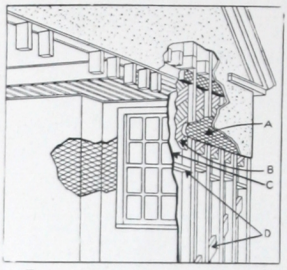
Details for Successful Stucco

According to the American Concrete Institute, the architecture should be adapted to stucco. Overhanging roofs or similar projections are preferable because of their protection at the top of the wall. Stuccoed cornices, copings and other exposed horizontal surfaces, should be avoided. These precautions will prevent unsightly streaks, which are entirely unnecessary.

Stucco should not be run to grade. Not only is there danger from frost, but the bottom of the walls will tend to become stained from dirt and moisture. Attention to the flashing and drips will also eliminate discolcration or even more serious defects. Where downspouts are installed they should be at least two inches from the surface of the finish. Window sills should project well over the stucco to allow water to drip without running down the face, and the ends of the sills should be stopped by pieces of metal so as to prevent concentration of dripping over the ends.

Proper Proportions

Roughly, the proper proportions for good stucco, and incidentally, the same mixture used by the U.S. Bureau of Standards on the 100% perfect test of back-plastered metal lath, is one of cement, three of sand, and one-tenth hydrated lime, together with the



Back plastered metal lath wall construction, as recommended by American Concrete Institute.

A—Metal lath back plastered.
B—Building paper doubled for extra insulation.
C—Interior plaster on metal lath.
D—Horizontal braces one inch from face of furring, and diagonal braces at corner cut into inside of stud.

required amount of hair for the economical application of the first coat. The amount of hair must be left to the experience of the plasterer, according to the sand used. The function of hair is to hold the mixture together while it is setting.

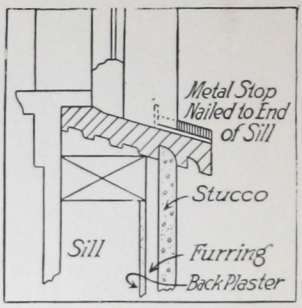
Back-plastering Preferred

Tests by U. S. Bureau of Standards prove conclusively that new stucco building should be back-plastered.

The method is as follows:

In back-plastered construction galvanized or painted $\frac{3}{8}$ inch crimped furring, not lighter than 22 gauge, or steel pencil rods, should be fastened direct to the 2x4 studs, using $1\frac{1}{4}$ inch x 14 gauge staples spaced 12 inches apart or 4D nails. The same depth of

Method of back plastering. Workman is applying scratch coat outside. Note upper stroke to avoid waste of plaster. The plaster is pushed through the mesh and then plastered on the inside.



Sectional view through window. Note slant of sill and drip which should be the rule on all horizontal woodwork.

furring should be adhered to around curved surfaces, and furring should be placed not less than $1\frac{1}{2}$ inches nor more than 4 inches on each side of and above and below all openings.

When furring forms an integral part of the metal lath to be used, then separate furring is omitted. No ordinary sheathing is required in this system. The plasterer puts one coat outside and when dry, plasters the back side of the coat between the studs—then finishes the job outside.

Strength of Back Plastered Stucco

A remarkable test of back plastered stucco was conducted at Armour Institute of Technology, Chicago, by Prof. J. C. Peebles. Sample sections of stucco walls, differently constructed, were placed in a pressure testing machine and force was applied diagonally. The sample made of back plastered stucco on metal lath endured a pressure of nearly 5,000 pounds more than the next best sample. This metal lath and plaster panel sustained a weight of more than seven tons diagonally. When the pressure finally was increased to the destruction of the sample the metal lath was torn from the studs, but even then the greater part of the plaster remained unbroken.

(Special booklet on Stucco gladly sent on request.)

Overcoating a Paying Investment

Many old houses are sound and strong. They need only a coat of stucco to bring them to a modern, up-to-date condition. If the siding is in good condition, the metal lath may be nailed directly to it, but if the siding is in bad shape, it is best to rip it off. In this case, furring strips are installed or self-furring lath is used.

Care should be exercised in following all directions for proper extension of window trim, sills, etc., and care should be exercised in pushing the stucco clear through the metal lath so that the metal lath is fully embedded in the cement.

Saves 13% of Coal

Restuccoing a frame house saves about 13% in the coal consumption, according to scientific tests made at the Armour Institute of Technology. The cost of overcoating can be learned from your local contractor, and when compared to repainting, and the saving in coal is taken into consideration, you will find it costs practically nothing, although from $1,000 to $5,000 has often been added to the value of a house at an outlay of less than half that amount for overcoating, and the house becomes readily salable.

Further information, of any kind, will be gladly given on request.

Write to Associated Metal Lath Manufacturers, 72 West Adams Street, Chicago, Illinois

Consult Your Architect

YOUR final dependence for advice on all construction questions rests with your own architect. Now that you are informed on this subject of Metal Lath, the thing for you to do is to make up your mind that you are going to have metal lath in your house, therefore talk about it with your architect.

By this kind of intelligent cooperation you will be enabled to have a much better house. Your architect knows that the most important part of a house is the fundamentals—the things that, once in, cannot be changed. The architect is often embarrassed and hindered by the owner not being informed and properly insistent on cooperating to produce the ideal desired by both. An owner, if not acquainted with the fundamental requirements of good building, is likely to specify non-essential things that could as well be added later, and neglect to specify the essential fundamentals that must be built into the home at the beginning.

Remember then that among the fundamentals of sound building, metal lath is chief. It need not be put throughout the house. Be sure metal lath is specified in the most important places.

If you contemplate buying a house under construction, insist that metal lath be specified in the vulnerable points for fire protection and in the prominent rooms for crack prevention. The ceilings of the living and dining rooms, the bathroom and kitchen wainscots, and a few other prominent places where cracks are an especial disfigurement, can be protected by metal lath for an almost negligible expenditure. The 5 points vulnerable to fire can be protected to make your family and investments safe at an expenditure only a trifle over ordinary old fashioned construction.

1. For an Up-to-Date house that is a good investment and will not depreciate—Build with Metal Lath.
2. For Beauty of walls and economy in upkeep — Build with Metal Lath.
3. For Safety from fire for your property and your family—Build with Metal Lath.

Be sure to talk to your Architect or Builder about Metal Lath


Prevents
Cracks
Metal Lath
Stops
Fire